JÜLICH
Forschungszentrum

As a member of the Helmholtz Association, Forschungszentrum Jülich makes an effective contribution to solving major challenges facing society in the fields of information, energy, and bioeconomy. It focuses on varied tasks in the area of research management and utilizes large, often unique, scientific infrastructure. Come and work with around 6,400 colleagues across a range of topics and disciplines at one of Europe's largest research centres.

The Institute for Energy and Climate Research, Troposphere (IEK-8), investigates the chemical and physical processes in the troposphere that impact the chemical composition of the atmosphere. The air quality related project 'MesSBAR' (https://www.bmvi.de/SharedDocs/DE/Artikel/DG/mfund-projekte/messbar.html) develops and validates atmospheric pollutant measurements (including aerosols, NOx, and O3) installed on highly automated unmanned aerial vehicles (UAV/drones). We support the drone campaigns within the project with air quality forecasts and 4D-var (four dimensional variational) analyses obtained with the EURAD-IM (EURopean Air pollution Dispersion-Inverse Model, https://eurad.uni-koeln.de/) chemistry transport model. With the 4D-var data assimilation method, the challenge to optimize initial values and emissions for model simulations will be faced.

Within the team of Atmospheric Modelling we are offering a

PhD Position – Air Quality Data Assimilation of Drone-based Observations

Your Job:

This PhD-project comprises the forecast and analysis of atmospheric chemical conditions for the drone-based measurement campaigns within MesSBAR. This includes especially flight planning for optimal analysis scenarios with respect emission source specification. The focus is placed on the analysis of urban and polluted regions and the characterization of the predominant emission sources. Therefore, 4D-var data assimilation is applied within the EURAD-IM model, using the drone based observations as well as other ground, flight and satellite data. Further, the quantification of the information gain and limits provided by drone observations, and the uncertainties within the analysis system will be identified and evaluated.

Your tasks in detail:

- Adaptation of the EURAD-IM code for the assimilation of drone-based observations
- Highly resolved air quality forecasts and their evaluation related to consulting

The job will be advertised until the position has been successfully filled. You should therefore submit your application as soon as possible. We look forward to receiving your application via our **Online-Recruitment-System!**

Questions about the vacancy?

Get in touch with us by using **our contact form.**

Please note that for technical reasons we cannot accept applications via email.

www.fz-juelich.de

Zertifikat seit 2010
audit berufundfamilie

measurement flight planning
- Drone campaign supporting simulations
- Implementation of an alert tool for air pollution threshold exceedances
- 4D-var analyses of drone measurement campaigns
- Investigation of the optimization potential of emission sources using 4D-var
- Quantification of uncertainties, benefits and limitations

Your Profile:
- M. Sc. degree in physics, mathematics, meteorology, or a related field
- Good knowledge in software development using FORTRAN90 and Python
- Strong interest in atmospheric physics and chemistry
- Excellent knowledge of written and oral German and English
- Outstanding organizational skills and the ability to work independently
- Very good cooperation and communication skills and ability to work as part of a team in an international and interdisciplinary environment
- Experiences in numerical modelling are desirable
- Experiences on high performance computing (HPC) are desirable

Our Offer:
- Cooperation between IEK-8 and other partners outside the research centre provides an ideal fundament to combine competences across different disciplines (meteorology, environmental science, high performance computing, software development and data science)
- Excellent scientific environment and technical facilities – ideal conditions for successfully completing a doctoral degree
- A highly motivated group as well as an exciting international and interdisciplinary working environment at one of Europe`s largest research establishments
- Continuous scientific mentoring by your scientific advisor
- Participation in overarching seminars including certificate
- Further development of your personal strengths, e.g. via a comprehensive further training programme
- Pay in line with 67,5 % of pay group 13 of the Collective Agreement for the Public Service (TVöD-Bund).
- Information on employment as a PhD student at Forschungszentrum Jülich can be found here http://www.fz-juelich.de/gp/Careers_Docs

Forschungszentrum Jülich promotes equal opportunities and diversity in its employment relations.
We also welcome applications from disabled persons.